## REMARKS

The present application contains elected claims 1-3, 19-22 and 32 and non-elected claims 4-18 and 23-31.

By this amendment, claims 2-18 and 21-31 have been canceled and claims 1 and 19 have been amended.

More specifically, non-elected claims 4-18 and 23-31 have been canceled and independent claims 1 and 19 have been amended to incorporate the subject matter of dependent claims 2 and 21, respectively. Thus claims 2 and 21 have also been canceled. In addition, claims 3 and 22 have been canceled to avoid inconsistency with the amended claims.

Accordingly, only claims 1, 19, 20 and 32 remain pending in this application.

Claims 1 and 19 stand finally rejected under 35 U.S.C. §102(e) as being anticipated by Knight et al. ("Knight"). Claim 32 stands finally rejected under 35 U.S.C. §103(a) as being unpatentable over Knight in view of Koyanagi et al. ("Koyanagi"). The Examiner stated that Knight discloses a near-field optical head comprising a slider 310 supported by a suspension arm 2104 providing a load weight and obtaining a floating force due to a relative motion of the slider with respect to a recording medium 302 due to a balance between the load weight and the floating force, and a probe 340 provided in a bottom surface of the slider for producing a

near-field light or converting a near-field light produced on a surface of the recording medium into a propagation light, wherein the recording medium and the probe 340 interact through the near-field light when the slider undergoes scanning movement relative to the surface of the recording medium to effect at least one of the recording of information onto the recording medium and the reproducing of information stored on the recording medium, and wherein the probe protrudes from the bottom surface of the slider toward the recording medium so that a distance between the probe and the recording medium is smaller than a distance between the bottom surface of the slider and the recording medium.

The Examiner further stated that Knight discloses a probe comprised of a microscopic aperture formed in the slider (citing col. 69, lines 7-9; col 6, lines 37-40; and Figs. 3, 6, 21 and 22), or a tapered projection

Koyanagi was cited as disclosing a probe comprising a tapered projection mounted to a support member and having a sharpened tip protruding from the bottom surface of the support member.

As previously noted, claims 1 and 19 have been amended to incorporate the subject matter of claims 2 and 21, respectively. Thus, claims 1 and 19 now recite that the probe has a microscopic aperture for producing a near-field light or

converting a near-field light produced on a surface of a recording medium into a propagation light. Applicants respectfully submit that amended independent claims 1 and 19 patentably distinguish over the prior art of record.

The present invention provides a near-field optical head with a slider having a probe comprised of a microscopic aperture provided in a bottom surface thereof. A gap is formed between a recording medium and the bottom surface of the slider. Near-field light is produced or converted into propagation light by the microscopic aperture and the recording medium and the microscopic aperture interact through the near-field light when the slider undergoes scanning movement relative to the recording medium to effect recording or reading of information on the recording medium.

Amended independent claim 1 recites that the probe comprises a microscopic aperture formed in a bottom surface of the slider and additionally recites that near-field light is produced or converted by the microscopic aperture, and that a distance between the probe and the recording medium is smaller than a distance between a part of the bottom surface of the slider closest to the recording medium and the recording medium so that the probe can be brought to within several nanometers to several tens of nanometers close to the recording medium to enable high resolution optical reading and/or recording of data on the recording medium.

Amended independent claim 19 contains similar language, and recites a near-field optical head having a support member and a probe protruding from a bottom surface of the support member and having a microscopic aperture formed therein for producing or converting near-field light such that a part of the bottom surface of the support member closest to a sample is more distant from the sample than the probe so that the probe can be brought to within several nanometers to several tens of nanometers close to the sample.

Knight fails to identically disclose the claimed subject matter of amended independent claims 1 and 19. Anticipation under 35 U.S.C. §102 requires the disclosure, by a single reference, of all claimed subject matter. Absent a disclosure that the probe comprises a microscopic aperture formed in the slider for producing or converting near-field light as recited by amended independent claims 1 and 19, anticipation cannot be found. W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) ("Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration") (emphasis added).

Knight does not disclose a probe formed in (claim 1) and protruding from (claim 19) a slider or a support member and having a microscopic aperture (claims 1 and 19) for

producing a near-field light or converting a near-field light produced on a surface of the recording medium into a propagation light.

In accordance with the teachings of Knight, a near-field light is produced by a complex structure including a solid immersion lens (SIL) used for focusing a laser beam to a precise location proximate the surface of a recording medium so that near-field light is produced.

More specifically, Fig. 3 of Knight illustrates a flying head 300 located adjacent to an optical recording medium 302. The head 300 has optics together with a slider 310. The slider 310 has a top surface 312, a channel surface 314, and air-bearing surfaces 316. The air-bearing surfaces 316 are the part of the bottom surface of the slider that is closest to the recording medium, and ride at a predetermined height above the recording medium 302 while the recording medium 302 is moving at a specific speed.

The optics include a reflector 320, an objective lens 330, and a solid immersion lens (SIL) 340, each of which is mounted to the slider 310. The SIL 340 is substantially or entirely contained within the slider 310. The objective lens 330 is mounted onto or near the top surface 312 of the slider 310 to focus the incident electromagnetic radiation, such as a laser beam, onto the SIL 340. An optically clear path 350 is

provided between the SIL 340 and the objective lens 330 so that the electromagnetic radiation may be effectively transmitted from one to the other and back again. The optically clear path 350 includes any optically transparent material, and may be air, glass or optically clear plastic.

The electromagnetic radiation traveling through the path 350 is incident on the partial spherical surface 342 of the SIL 340. The SIL 340 can be a single partial sphere or a lesser portion of a partial sphere plus a flat plate. The SIL 340 has a generally spherical surface 342 which constitutes the partial spherical portion and a flat portion 344, which may be a flat surface or a flat plate.

Thus, Knight discloses use of a solid immersion lens (SIL) 340 rather than a microscopic aperture to produce a near-field light. Although the SIL is disposed in an aperture formed in a slider, Knight does not disclose use of a microscopic aperture to produce or convert near-field light as required by amended independent claims 1 and 19.

The two surfaces of the SIL, including the spherical surface 342 and the flat portion 344, are contained within an aperture or opening formed in the body of the slider 310. The SIL and not the aperture produces the near-field light .

Contrastingly, the invention recited by amended independent claims 1 and 19 has a probe having a microscopic

aperture which protrudes (claim 19) below a bottom surface of a slider to produce or convert near-field light.

Accordingly, Knight does not anticipate the invention recited by independent claims 1 and 19 or the subject matter of dependent claims 20 and 32.

In view of the foregoing amendments and discussion, the application is now believed to be in condition for allowance. Accordingly, favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

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**MAILING CERTIFICATE**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: MS AF COMMISSIONER FOR PATENTS, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.

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May 5, 2003
Date

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

Claims 1 and 19 have been amended as follows:

1. (Three Times Amended) A near-field optical head, comprising:

a slider supported by a suspension arm providing a load weight and obtaining a floating force due to a relative motion of the slider with respect to a recording medium so that a gap is produced between a bottom surface of the slider and a surface of the recording medium due to a balance between the load weight and the floating force; and

a probe comprising a microscopic aperture formed [provided] in the bottom surface of the slider for producing a near-field light or converting a near-field light produced on a surface of the recording medium into a propagation light;

wherein the recording medium and the probe interact through the near-field light when the slider is caused to undergo scanning movement relative to a surface of the recording medium to thereby effect at least one of the recording of information onto the recording medium and the reproducing of information stored on the recording medium; and

wherein the probe protrudes from the bottom surface of the slider toward the recording medium so that a distance between the probe and the recording medium is smaller than a

distance between a part of the bottom surface of the slider closest to the recording medium and the recording medium so that the probe can be brought to within several nanometers to several tens of nanometers close to the recording medium to enable high resolution optical reading and/or recording of data on the recording medium.

19. (Twice Amended) A near-field optical head comprising: a support member mounted to undergo relative movement with respect to a sample; and a probe protruding from a bottom surface of the support member and having a microscopic aperture formed therein for producing a near-field light or converting a near-field light produced at a surface of the sample into a propagation light; wherein the sample and the probe interact through the near-field light when the support member undergoes relative movement with respect to the surface of the sample; and wherein a part of the bottom surface of the support member closest to the sample is more distant from the sample than the probe so that the probe can be brought to within several nanometers to several tens of nanometers close to the sample.